ROBOTICS PROGRAMMING WORKSHOP1 (CSE3197)

Mid-Term Project Proposal Submission and Approval Form

# Particulars of Student (s)

[Maximum 2 students per project]:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Group No.:** | | | | |
| **Sl. No.** | **Registration No.** | **Name** | **Branch**  **(Section)** | **Signature** |
| 1. | 2241019222 | SATYAJIT SAHU | CSE(IOT) |  |
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# Project Title (in CAPITAL letters):

# INNOVATIVE ARDUINO-POWERED AUTOMATIC PILL DISPENSER FOR MEDICATION.

# Project Description:

# The "Innovative Arduino-Powered Automatic Pill Dispenser for Medication" is a smart healthcare solution designed to assist patients in managing their medication schedules effectively. This device, powered by an Arduino microcontroller, automates the dispensing of pills at pre-set times, ensuring accurate dosages and preventing missed doses. The system features a user-friendly interface for setting medication schedules, one can put his hands near dispenser and the medicine will automatically drop from the machine. This project aims to improve patient compliance, enhance safety, and reduce the risk of medication errors, especially for individuals with chronic conditions or memory impairments.

# Background

# Medication non-adherence is a common problem, particularly among elderly patients or those managing multiple prescriptions, leading to serious health complications, hospitalizations, and increased healthcare costs. Traditional methods such as pillboxes and manual reminders are often ineffective, prone to human error, and provide no real-time monitoring or automation. With advancements in technology, there is an increasing demand for smarter healthcare solutions to improve medication adherence and reduce errors. The Innovative Arduino-Powered Automatic Pill Dispenser project addresses this need by developing an automated system that accurately dispenses medication at scheduled times, ensuring timely dosage while minimizing human oversight. Powered by an Arduino microcontroller, this device offers features such as reminders, controlled pill dispensing, aiming to improve patient compliance, safety, and overall health outcomes. By leveraging simple yet powerful technology, this project seeks to offer a reliable and cost-effective solution for medication management.

# Problem Statement:

# The problem of medication non-adherence is a significant concern, particularly for elderly patients or those managing multiple prescriptions, leading to missed doses, incorrect medication intake, and potential health risks. Current pill management methods, such as traditional pillboxes or manual reminders, are prone to human error and do not offer adequate monitoring or automation. There is a need for an efficient, reliable, and user-friendly solution that ensures timely and accurate medication dispensing while minimizing human oversight. The Innovative Arduino-Powered Automatic Pill Dispenser aims to address these challenges by automating pill distribution, providing reminders thereby improving medication adherence and patient safety.

# Objectives:

# Automate Medication Dispensing: Develop a system that accurately dispenses the correct dosage of medication at pre-set intervals without human intervention.

# Improve Medication Adherence: Ensure timely medication intake by providing alerts or notifications to patients, reducing the risk of missed or incorrect doses.

# Enhance Patient Safety: Minimize medication errors by using controlled, pre-programmed pill distribution mechanisms and human interception (as needed).

# Scope:

# Hardware Design: Develop the physical structure of the pill dispenser, including compartments for different medications, a dispensing mechanism, and integration of sensors for pill counting and detection.

# User Interface: A user-friendly interface can be created for setting medication schedules, which can be through a simple LCD screen, buttons, or even a smartphone application for remote setup and monitoring.

# Safety Features: Incorporate safeguards, such as password protection for schedule changes, lockable compartments, and backup power options to ensure functionality even during power failures.

# Methodology:

# Research and study different IoT devices and wireless communication protocols.

# Design the circuitry for the Arduino boards and sensors.

# Design the physical structure, including pill compartments, a dispensing mechanism, and buttons or screens for message display.

# Research existing pill dispensers to identify gaps and areas of improvement.

# Expected Outcomes:

# The system will dispense the correct medication at the specified times, reducing the chances of human error, missed doses, or overdoses.

# A simple and accessible interface will enable easy programming and operation, catering to users with limited technical skills, such as elderly patients.

# A working prototype of the Arduino-powered pill dispenser will be built and tested, demonstrating its feasibility and potential for further development or commercialization.

# The project will provide a scalable design that can be expanded or modified to include more advanced features like voice recognition, cloud storage, or even machine learning.

# Components Required

## ****Hardware****

* Arduino nano
* IR Sensor
* Breadboard
* LCD Screen
* Buzzer
* Servo Motor

## ****Software****

* Arduino IDE

# Skills Required

# Arduino Programming

# Functioning of different sensors used and how to integrate them.

# Knowledge of circuit building.

# Challenges Foreseen

* Ensuring the consistent operation of mechanical components.
* Balancing the cost of components with the need for reliability.
* Making of the well-designed body cover for the project.

# Timeline

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| --- | --- |
| **Time Period** | **Workflow** |
| 03/10/2024 | Finalizing the workflow and components |
| 04/10/2024 | Programming and interfacing of the sensors and other components |
| 05/10/2024 | Programming and interfacing of the sensors and other components |
| 14/10/2024 | Interfacing, testing and Report writing |
| 15/10/2024 | Report finalization |

# References

Innovative Arduino-Powered Automatic Pill Dispenser for Medication:

https://www.viralsciencecreativity.com/post/arduino-automatic-candy-dispenser-machine

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| --- | --- | --- | --- | --- |
| Approved |  |  | **(Signature of the Faculty)** | |
|  |  |  | **Date:** |  |
| Not Approved |  |  |